P-3.2 Apply the law of conservation of energy to the transfer of mechanical energy through work.

Revised Taxonomy Levels 3.2 C_A Apply (implement) procedural knowledge
Key Concepts
Law of conservation of energy
Mechanical energy
work

In 6th grade, students recognize that "energy is the ability to do work"
In physical science students

- Explain how the law of conservation of energy applies to the transformation of various forms of energy (including mechanical energy, electrical energy, chemical energy, light energy, sound energy, and thermal energy).
- Explain work in terms of the relationship among the force applied to an object, the displacement of the object, and the energy transferred to the object (PS-6.3).
- Use the formula W = Fd to solve problems related to work done on an object. (PS-6.4) and that the unit for work is the joule (Newton-meter)
- Address the concept of work as a means of transferring energy from one system to another
- Physical science students have not addressed energy quantitatively so they have not addressed the units used to measure energy.

It is essential for students to

- Analyze the transfer of mechanical energy through work
- Solve problems showing that mechanical energy is conserved as it is transferred from one object to another through work

Assessment
The verb implement (apply) means that a major focus of assessment should be for students to show that they can "apply a procedure to an unfamiliar task". The knowledge dimension of the indicator, procedural knowledge means "knowledge of subject-specific techniques and methods" In this case the procedure is application of the concept of the conservation of energy as it is transferred from one object to another through work. The unfamiliar task should be a novel word problem or laboratory investigation. A key part of the assessment will be for students to show that they can apply the knowledge to a new situation, not just repeat problems which are familiar. This requires that students have a conceptual understanding of each of energy conservation as well as mastery of the skills required to implement the mathematical equations or in order to solve problems.